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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,625	01/18/2002	Wytze Eeuwke Van Der Veer	UC1.PAU.02	3114
7590	02/18/2004		EXAMINER	
Daniel L. Dawes Myers, Dawes & Andras LLP Ste 1150 19900 MacArthur Blvd Irvine, CA 92612			LEE, JOHN D	
			ART UNIT	PAPER NUMBER
			2874	
DATE MAILED: 02/18/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/052,625

Applicant(s)

VAN DER VEER, WYTZE
EEUWKE

Examiner

John D. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-25 and 27-30 is/are rejected.
- 7) ☒ Claim(s) 11 and 26 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

The three (3) sheets of drawing filed on March 18, 2002, are acceptable.

The disclosure is objected to because of the following informality: the title appearing on page 1 and above the abstract on page 27 does not agree with the title of the invention set forth in the declaration. Clarification and appropriate correction is required so that the correct title appears wherever used.

The disclosure is further objected to because of the following minor informalities: on page 2, line 11, "elements" should be "element"; on page 3, line 8, "art" should be inserted after "prior"; and on page 5, line 16, "is" should be "are". Appropriate correction is required. Applicant's cooperation is requested in correcting any other errors of which applicant may become aware in the specification.

Claims 13 and 28 are objected to because of the following minor informalities: in line 2 of claim 13 and in line 3 of claim 28, the word "other" should be inserted after "each". Appropriate correction is required.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10, 12-25, and 27-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Petrov et al IEEE J.Q.E. article in view of U.S. Patent 5,781,571 to Nabors et al. Petrov et al discloses an apparatus and method for generating narrow bandwidth picosecond optical pulses that is essentially the same as the apparatus and method being claimed. The Petrov et al apparatus includes a mode-locked Ti:sapphire

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pulsed pump laser, an optical parametric oscillator pumped by a pump pulse train generated by the pump laser, and an optical parametric amplifier having an input coupled to an output of the optical parametric oscillator. See Figure 1. The details of the cavity of the optical parametric oscillator are not given by Petrov et al, but the reference states that it is a Spectra-Physics model 730 MOPO. As is known by those of ordinary skill in the art, this type of MOPO has a cavity similar to that shown by Nabors et al, wherein a grating-mirror termination forms one end of the cavity and a cavity mirror forms the other end of the cavity, with an optically active nonlinear medium therebetween. It would therefore have been obvious to conclude that the MOPO of the Petrov et al apparatus has these features. Note that the grating-mirror termination shown in Nabors et al (Figure 3) is comprised of a grazing incidence grating and a tuning mirror, with the grating and mirror being arranged with respect to each other so that a diffracted first order is reflected back from the mirror to the grating and into the cavity. The periodicity of the Nabors et al grating is not stated, but the claimed periodicity (groove spacing) of about a wavelength of the light being used would have been obvious for the person of ordinary skill for this type of device. The inclination of the Nabors et al grating appears to be within applicant's claimed 10 degrees and, as stated earlier, the first grating order of diffraction is maximized. The Nabors et al tunable mirror works in exactly the same way as the claimed tunable mirror to adjust the resonant wavelength of the cavity. The Petrov et al apparatus serves to narrow the bandwidth of each successive pulse that is reflected within the oscillator cavity, so using the Nabors et al grating-mirror termination in the cavity would continue to perform the

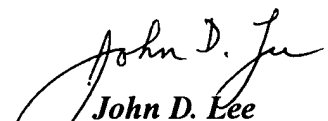
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same narrowing. Although Nabors et al does not address cavity stability, the use of a concave cavity mirror to accomplish same is well known in the art, and the use of such a stabilizing mirror in the Nabors et al optical parametric oscillator cavity would thus have been obvious to a person of ordinary skill in the art. Such stabilizing arrangements flatten the wavefronts at the ends of the cavity, relative to the wavefront in the center of the cavity. Note that the grating-mirror termination of Nabors et al (Figure 3) outcouples a 0th order diffraction of light; this outcoupled light would enter the optical parametric amplifier in the Petrov et al/Nabors et al combination. Although Petrov et al is designed to use ZnGeP₂ as the nonlinear crystal, Nabors et al discloses the use of BBO. The use of BBO in the Petrov et al/Nabors et al combination would thus have been obvious. The dual BBO crystal “walkoff” arrangement specified in applicant’s claims 13/14 (and 28/29) is well known in the art; its use would thus have been obvious. It is believed that the Petrov et al/Nabors et al combination apparatus would inherently have a bandwidth characterized by a Fourier limit with the bandwidth of the generated pulse being near the Fourier limit.

Claims 11 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Petrov et al does not disclose or suggest a coupled OPO-OPA structure wherein the pump laser generates a single pulse which is input into the OPA to coincide with the last pulse of a pulse train output by the OPO and coupled into the input of the OPA. No other prior art of record suggests such a structure, either.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 4,349,907 to Campillo et al describes an apparatus and method for generating narrow bandwidth picosecond optical pulses, but in a different manner than that claimed by applicant. U.S. Patent 5,663,973 to Stamm et al shows a dual OPO arrangement for producing tunable narrowband radiation, wherein a grazing-incidence grating-mirror termination is used in one of the OPO cavities. Another narrow bandwidth picosecond optical pulse generator including an optical parametric amplifier can be seen in Japanese Patent 10-170967 to Imanishi et al.

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (571) 272-2351. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956, to the technical support staff supervisor (Team 8) at telephone number (571) 272-1564, or to the Technology Center 2800 Customer Service Office at telephone number (571) 272-1626.


John D. Lee
Primary Patent Examiner
Group Art Unit 2874